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Preliminary and Short Report

SUPPRESSION OF SEBACEOUS GLAND ACTIVITY WITH EICOSA-5:8:11:14-TETRAYNOIC ACID*

JOHN S. STRAUSS, M.D., PETER E. POCHI, M.D. AND ERWIN N. WHITMAN, M.D.

In the testing of compounds which inhibit cholesterol synthesis, it was found that eicosa-5:8:11:14-tetraynoic acid [$CH_3(CH_2)_4(C{\equiv}CCH_2)_4(CH_2)_2COOH$], which blocks the pathway of cholesterol synthesis between acetate and mevalonic acid (1), exerted a suppressive effect on sebaceous gland secretion. This report describes these preliminary studies of the effect on sebum production in man from the oral administration of this unsaturated fatty acid.

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* From the Department of Dermatology and Evans Memorial Department of Clinical Research, University Hospital, and the Department of Dermatology, Boston University School of Medicine, Boston University Medical Center, Boston, Mass., and the Research Division of Hoffmann-La Roche Inc., Nutley, New Jersey.

MATERIAL AND METHOD

Sixteen males, age 20 to 45, were given oral doses of eicosa-5:8:11:14-tetraynoic acid for periods ranging from 7½ to 19 weeks. Dosage varied from 0.5 to 2.0 gm daily. Eight subjects (nos. 1–8) were normal volunteers; eight subjects (nos. 9–16) had acne of a moderate to severe degree; one of these subjects (no. 12) had acne rosacea with severe rhinophyma. Sebum production was measured on repeated occasions before and every one to four weeks during drug administration using a method described elsewhere (2). Statistical analyses were done by the methods of paired comparison.

TABLE I

Sebum production in male subjects administered eicosa-5:8:11:14-tetraynoic acid

	Subject	Daily dose (gm)	Treatment period (weeks)	Sebum production (mg lipid/10 sq cm/3 hours)		
				Pre-treatment	Treatment	% Decrease
Normal	1	1.5	8	4.29	1.98	54.3
	2	1.5	9	2.14	1.13	47.2
	3	1.5	9½	3.41	2.34	31.4
	4	1.0	9	1.42	0.98	31.0
	5	2.0	10	1.57	1.12	28.7
	6	2.0	12	2.29	1.67	27.1
	7	0.5–2.0	16	2.05	1.57	23.4
	8	0.5–2.0	14	4.35	3.78	13.1
Acne	9	1.5	7½	2.69	0.97	63.9
	10	1.0	10½	4.82	1.95	59.5
	11	1.5	11	4.43	1.93	56.4
	12	.75–1.0	19	3.25	1.47	54.8
	13	1.0	13	4.08	1.88	53.9
	14	1.5	10	2.86	1.32	53.8
	15	1.5	11	2.94	1.40	52.4
	16	1.5	8½	4.73	3.49	26.2

RESULTS

The results for the individual subjects are shown in Table I in which mean values for all pre-treatment and all post-treatment sebum tests were calculated for each individual. Every subject showed a decrease in sebum production, ranging from 13.1% to 63.9%. In 11 of the 16 subjects the de-

TABLE II

Group analysis of sebum production response to eicosa-5:8:11:14-tetraynoic acid

	Sebum production (mg lipid/10 sq cm/3 hours)			Significance
	Pre-treatment	Treatment	% Decrease	
Normal subjects	2.74	1.89	32.3	$p < .01$
Acne subjects	3.72	1.80	51.6	$p < .001$
All subjects	3.20	1.85	44.2	$p < .001$

crease in sebum exceeded 30%, with only one (subject 8) showing less than a 20% fall in sebum output. As indicated in Table II, the average suppression of 32.3% in the normal subjects and of 51.6% in the acne patients was highly significant for each group ($p < .01$ and $p < .001$, respectively). The average reduction in sebum secretion for all the individuals studied was 44.2% ($p < .001$).

There were seven subjects with acne vulgaris and one with acne rosacea. Although their numbers were too few to allow for definitive conclusions, it was observed in every case that the activity of the disease was either much reduced or abolished once sebaceous suppression had been achieved.

SUMMARY

The oral administration of eicosa-5:8:11:14-tetraynoic acid, an unsaturated fatty acid, produced a decrease in sebum production in each of 16 male subjects studied. The average reduction in sebum secretion was 44.2%, and this was highly significant ($p < .001$).

REFERENCES

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